Construction Inspector, Step 1

New Hires are placed at step one until they meet the minimum requirements and qualifications to move to step two. Building Construction Inspectors must obtain the following inspection credentials as issued by the State of Wisconsin within the one year probationary period:

1. ***Wisconsin Commercial Building Inspector***
2. ***Wisconsin Uniform Dwelling Code Construction Inspector***
3. ***Wisconsin Uniform Dwelling Code Heating, Ventilation and Air-Conditioning (HVAC)***

An inspector holding these credentials upon entering the City of Milwaukee Construction Trades Division, with supervisor and DNS administrative approval, may be eligible for appointment to a higher career ladder step (based on certifications held at the time of appointment) with the one year probationary period waived for the sole purposes of this Career Ladder. Separate probationary period requirements mandated by the Department of Employee Relations still apply.

Secondly, an inspector must demonstrate a thorough knowledge pertaining to the fundamentals of performing basic construction inspections as they relate to good communication, construction methodologies, code knowledge, problem solving and code interpretation and its enforcement. Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of:

General Competencies

- *Customer Communication Skills*
- *Management and Control of Assigned Construction District*
- *Familiarity of Necessary Zoning*
- *Ability to coordinate with other DNS and City Entities*
- *Ability to Evaluate and Interpret Construction Plans*
- *Thorough knowledge of the Milwaukee Code of Ordinances*
- *Code Administration and Definitions of Commercial and 1&2 Family Construction Codes*
- *Familiarity of DNS processes and skill set with regards to computer programs.*

Commercial Code Competencies

- *Use and Occupancy Classifications*
- *Special Use Occupancies and Elements*
- *Height and Area Limitations Based on Type of Construction*
- *Fire Resistance and Protection Requirements*
- *Interior Finishes*
- *Use and Application of Glass, Glazing, Safety Glazing & Plastics*
- *Means of Egress*
- *Accessibility*
- *Building Systems Such as Lighting, HVAC, Plumbing Fixtures, Elevators, Generators*
- *Structural Components Such as Masonry, Wood, Steel and their Performance and Stability*
- *Safeguards During Construction*
- *Erosion Control and Storm Water Management Regulations*
- *Special Construction Such as Membrane Structures, Tents & Awnings*
- *Hazardous Occupancies*

- *Use & Application of the International Existing Building Code*
- *Use & Application of the International Fuel Gas Code*
- *Use & Application of the International Mechanical Code*
- *Use & Application of the International Energy Conservation Code*
- *Use & Application of ANSI A117.1 Standard for Accessible and Usable Buildings and Facilities*
- *Competency of Code Referenced Standards*
- *General Knowledge of the Milwaukee Code of Ordinances*
- *Familiarity and Application of the International Fire Code*

1 &2 Family Uniform Dwelling Code (UDC) Competencies

Construction

- *Design Criteria*
- *Loads & Materials*
- *Exits*
- *Interior Circulation*
- *Stairways & Elevated Areas*
- *Ladders*
- *Ramps*
- *Natural Light & Ventilation*
- *Ceiling Height*
- *Attic & Crawl Spaces*
- *Fire Separation & Dwelling Unit Separation*
- *Fireblocking*
- *Smoke Detectors*
- *Automatic Fire Sprinklers*
- *Protection Against Decay & Termites*
- *Foam Plastic*
- *Installation of Elevators or Dumbwaiters*
- *Excavations*
- *Erosion Control & Sediment Control*
- *Storm Water Management*
- *Excavations Adjacent To Adjoining Property*
- *Excavations For Footings & Foundations*
- *Footings*
- *Frost Protection*
- *Drain Tiles*
- *Foundations*
- *Floor Design*
- *Concrete Floors*
- *Garage Floors*
- *Wood Floors in Contact With The Ground*
- *Precast Concrete Floors*
- *Wood Frame Floors*
- *Decks*
- *Wall Design*
- *Exterior Covering*
- *Wood Frame Walls*
- *Masonry Walls*
- *Roof Design*
- *Roof & Ceiling Wood Framing*
- *Masonry Fireplaces*
- *Masonry Chimneys*
- *Factory-Built Fireplaces*
- *Construction in Floodplains*
- *Installation Standards of Manufactured Homes*

Energy Conservation

- *Energy Conservation Scope and Application*
- *Insulation Materials & Installation Basic Requirements and Protection*
- *Thermal Envelope Design & Requirements*
- *Prescriptive Insulation and Fenestration Criteria*
- *Specific Insulation Requirements*
- *Slab Floors*
- *Crawl Spaces*
- *Thermally Isolated Sunrooms*
- *Fenestration*
- *Air Leakage*
- *Vapor Retarders*
- *Ventilation & Moisture Control*
- *Indoor Temperatures & Equipment Sizing*
- *Temperature Control*
- *Duct Systems*
- *Duct & Plenum Sealing*
- *Pipe Insulation*
- *Air-Conditioner & Heat Pump Efficiencies*
- *Replacement Furnace & Boiler Efficiencies*
- *Simulated Performance Alternative Energy Conservation*

Heating, Ventilating & Air-Conditioning Design

- *Selection of Heating Equipment*
- *Types & Location of Equipment*
- *Solid-Fuel Burning Equipment*
- *Safety Controls*
- *Combustion Air*
- *Mechanical Draft Systems*
- *Equipment Maintenance Information*
- *Air Distribution Systems*
- *Ductwork*
- *Damper, Registers & Grills*
- *Piping*
- *Factory-Built Chimneys or Vents*
- *Gas Vents*
- *Chimney Connectors, Smoke Pipes & Stovepipes*
- *Multiple Appliance Venting*
- *Condensate Drains*
- *Fuel Storage & Supply Systems*
- *Equipment Location and Operation*

Additionally, an inspector must meet or exceed the thresholds for advancement established in the ***QUANTITATIVE CORE COMPETENCIES.***

Additional Steps.

After attainment of job required certifications as listed in the job description (Wisconsin Commercial Building Certification, UDC-Construction and UDC-HVAC Certifications) along with supervisor and DER approval the inspector may begin advancing in the career ladder. The below listed steps may be achieved in any order.

In order to advance to pay step 2 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for one of the below listed Qualitative Steps.

In order to advance to pay step 3 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for two of the below listed Qualitative Steps.

In order to advance to pay step 4 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for three of the below listed Qualitative Steps.

In order to advance to pay step 5 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for four of the below listed Qualitative Steps.

In order to advance to pay step 6 using Step options 2-6, the inspector must have achieved the Step 1 requirements and be able to provide evidence of completion for five of the below listed Qualitative Steps.

In each case above, for advancement to a higher pay step, the inspector shall obtain the required Qualitative and Quantitative measures associated with the step they are requesting. The quantitative core competencies must be achieved in the sequential order as outlined in the Quantitative Core Competencies document. In addition, inspector's performance, customer service, job skill and knowledge is subject to review by the supervisor for applicability for the step being requested and the time frame to be analyzed taking into consideration training, specialty projects, inspector workload, district composition, and other factors that may have an impact on performance.

Construction Inspector, Step Option 2

To advance a step using step option two, an inspector shall obtained the job required certifications/licensure as outlined in step one. Step option two requires the inspector to obtain the following inspection credentials or certification issued by the International Code Council (ICC):

1. ***ICC - Accessibility Inspector/Plan Examiner***
2. ***ICC – Fire Inspector 1***

Note: The Department recognizes the NFPA Fire Inspector I or Wisconsin Technical College System Board Fire Service Certification (Semester 1) as an equivalent to International Code Council Fire Inspector I.

An inspector using step option two must demonstrate a thorough knowledge of the fundamentals of performing basic construction inspections as they relate to Accessibility in Chapter 11 of the Commercial Building Code and ANSI A117.1 Standard "Accessible and Usable Buildings and Facilities". The inspector must demonstrate a thorough knowledge pertaining to hazardous occupancy inspections.

Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to advance to a step two:

Accessibility Core Competencies (ANSI A117.1 and IBC)

Application and Administration

- *Purpose*
- *Anthropometric Provisions*
- *Compliance Alternatives*
- *Referenced Standards*
- *Definitions*

Scoping

- *General*
- *Dwelling and Sleeping Units*
- *Administration*

Building Blocks

- *General*
- *Floor Surfaces*
- *Changes in Level*
- *Turning Space*
- *Clear Floor Space*
- *Knee and Toe Clearance*
- *Protruding Objects*
- *Reach Ranges*
- *Operable Parts*

Accessible Routes

- *General*
- *Accessible Routes*
- *Walking Surfaces*
- *Doors and Doorways*
- *Ramps*
- *Curb Ramps*
- *Elevators*
- *Limited-Use/Limited-Application Elevators*
- *Private Residence Elevators*
- *Platform Lifts*

General Site and Building Elements

- *General*
- *Parking Spaces*
- *Passenger Loading Zones*
- *Stairways*
- *Handrails*
- *Windows*

Plumbing Elements and Facilities

- *General*
- *Drinking Fountains*
- *Toilet and Bathing Rooms*
- *Water Closets and Toilet Compartments*
- *Urinals*
- *Lavatories and Sinks*
- *Bathtubs*
- *Shower Compartments*
- *Grab Bars*
- *Seats*
- *Washing Machines and Clothes Dryers*

Communication Elements and Features

- *General*
- *Alarms*
- *Signs*
- *Telephones*
- *Detectable Warnings*
- *Assistive Listening Systems*
- *Automatic Teller Machines (ATMs) and Fare Machines*
- *Two-Way Communication Systems*

Special Rooms and Spaces

- *General*
- *Assembly Areas*
- *Dressing, Fitting, and Locker Rooms*
- *Kitchens and Kitchenettes*
- *Transportation Facilities*
- *Holding Cells and Housing Cells*
- *Courtrooms*

Built-In Furnishings and Equipment

- *General*
- *Dining Surfaces and Work Surfaces*
- *Benches*
- *Sales and Service Counters*
- *Storage Facilities*

Dwelling Units and Sleeping Units

- *General*
- *Accessible Units*
- *Type A Units*
- *Type B Units*
- *Units with Accessible Communication Features*

ICC - Fire Inspector 1 - Core Competencies

General Inspection Administration

- *Communication*
- *Inquiry Response*
- *Inspection Reports*
- *Research*
- *Identification of Permitting*
- *Issuance of Permits*
- *Plan Review*
- *Recordkeeping*
- *Complaints*
- *Appeals Correspondence*
- *Legal Proceedings*

General Provisions for Fire Safety

- *Means of Egress*
- *Types of Construction*
- *Equipment and System Readiness*
- *Emergency Access*
- *Fire Flow Test and Data*
- *Emergency Planning - Applicability*
- *Emergency Planning – Evaluation*
- *Fire Protection Plan*
- *Inspection for Construction Type*
- *Hazardous Conditions*

Occupancies

- *Occupancy Classification*
- *Number of Occupants*
- *Inspection For Occupancy Group*

Regulated Materials and Processes

- *Industrial/Commercial*
- *Storage and Handling*
- *Interior Finishes*
- *Fire Growth*

These Skills and certifications build on important priorities of the building code that the inspector should already be familiar with and encounter on a regular basis in public buildings, namely enforcement of the Americans with Disabilities Act as well as sections of the code dealing with fire/life-safety features of buildings and/or structures.

Additionally, an inspector advancing using this step option must also meet or exceed the thresholds for advancement established in the ***QUANTITATIVE CORE COMPETENCIES.***

Construction Inspector, Step Option 3

To advance a step using step option three, an inspector shall have obtained the job required certifications/licensure as outlined in step one. Step option three requires the inspector to obtain the following inspection credentials or certification issued by the International Code Council (ICC):

1. ***ICC Mechanical Inspector***
2. ***ICC Commercial Energy Inspector***

An inspector at step three must demonstrate a thorough knowledge pertaining to the fundamentals of energy conservation and mechanical systems. How we treat a buildings thermal envelope and the heat loss associated with it can dramatically have an impact on the life cycle of a building and the interior environment for the occupants. Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to advance to a step three:

ICC - Commercial Mechanical Inspector - Core Competencies

Administration

- *Mechanical System Plan Reading*
- *Manufacturer's Installation Instructions*

Heating/Cooling/Water Heaters

- *Installations Of Mechanical Equipment Comply With Code Requirements*
- *Clearances For Equipment Is Maintained*
- *Proper Access Is Provided*
- *Supply And Return Air*

- *Connections To Plenums*
- *Boiler And Water Heater Requirements*
- *Fuel Burring Equipment, Crematories, Incinerators, Hydronic Heating Systems, Sauna Heaters, Decorative Appliances, Etc…*

Exhaust and Ventilation Systems

- *Hazardous Exhaust Systems*
- *Source Capture Systems*
- *Supply, Return, And Outside Air Requirements*
- *Ventilation Requirements*
- *Exhaust Systems*
- *Kitchen Hood Systems*
- *Product Conveying Ventilations Systems*

Duct Systems

- *Duct Construction And Installation*
- *Support Of Ducts*
- *Duct And Plenum Design*
- *Smoke And Fire Dampers*
- *Fire Suppression Requirements*
- *Smoke Detection Requirements*

Combustion Air

- *Proper Sources For Air Supply To Fuel Burning Appliances*
- *Size And Locations Of Openings*
- *Materials For Installation*

Chimneys And Vents

- *Size, Type And Location Of Venting*
- *Vent Connections And Terminations*

Fuel Supply Systems

- *Gas Piping Systems Are Installed With Proper Materials*
- *Fittings, Valves And Connections Are In Compliance With The Cod*

ICC - Commercial Energy Inspector - Core Competencies ***General Plan Review Issues***

- *Applicability to determine if a building is required to comply with the provisions of the energy code.*
- *Additions, Alterations, and Change Of use. Verify whether the work is required to comply with provisions of the code for new buildings and determine if the occupancy or use of the structure has changed so as to require energy code compliance.*

Building Envelope

- *General Envelope Requirements*
- *Opaque Envelope Compliance*
- *Windows, Skylights, and Doors*
- *Air Leakage*
- *Moisture Control*

Mechanical Systems

- *Mechanical Summary. Verify installed equipment complies with the construction documents for type, size, and efficiencies. Verify operation manuals are provided with the equipment where required.*
- *Energy Recovery and Complex Systems*
- *Economizers*
- *Duct and Piping Systems. Inspect HVAC equipment, ducts, and piping for required insulation and sealing as specified on construction documents and where required by the code.*
- *Fan and Pump Systems*
- *HVAC Controls*

Electrical Power and Lighting Systems

- *Exempt Lighting and Equipment.*
- *Lighting Power*
- *Lighting Controls. Verify compliance of lighting controls for building interiors and exteriors as specified on construction documents and as required by the code.*
- *Wiring Methods and Metering.*

Building Service Water Heating Systems and Equipment

- *Water Heating Equipment. Inspect piping insulation, circulation pump controls, heat traps, point of use controls, pool heaters, and covers are installed as specified on construction documents and as required by the code.*

Upon the completion of this step option, the inspector should be highly specialized in mechanical systems and energy requirements that are present and fundamental in every building.

Additionally, an inspector advancing using this step option must also meet or exceed the thresholds for advancement established in the ***QUANTITATIVE CORE COMPETENCIES.***

Construction Inspector, Step Option 4

To advance a step using step option four, an inspector shall have obtained the job required certifications/licensure as outlined in step one. Step option four requires the inspector to obtain the following inspection credentials or certification issued by the International Code Council (ICC):

1. ***ICC Building Plans Examiner***
2. ***ICC Mechanical Plans Examiner***

An inspector at using step option four must demonstrate a thorough knowledge pertaining to the fundamentals of plans exam for both the building and mechanical systems. An inspector at this step is expected to be able to easily read and interpret complex commercial building and mechanical plans. Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to advance to a step four:

ICC- Building Plans Examiner - Core Competencies

- *Project administration. Verify that plans, specifications, and other project information are provided and are complete. Verify that the project is designed by approved persons when required, and has required approvals. Verify that design calculations are submitted in support of structural designs. Verify that alternative materials and methods of construction which are not specified by the building code are listed by an approved standard. Verify that estimated project valuations are consistent with industry norms.*
- *Public Information and Legal. For new and existing structures, answer questions about the need for permits and inspections including special inspections and structural observations, general code compliance of designs, procedures, and materials.*
- *Building Planning. As to building location, verify from the site plan that the building or structure location is in compliance with the requirements of the local ordinances, fire separation regulations, fire access, and setbacks. Verify that final grade will provide the required slope away from the footing or foundation wall. Verify finish floor elevation in flood-hazard areas for compliance with local and federal requirements.*
- *Allowable Increases. Verify that allowable height and area increases are based on the open perimeter, and compliance of access to the open space. Verify compliance of allowable area modifications for automatic fire suppression and special occupancies.*
- *Use and Occupancy Classification. Verify that use and occupancy classification, incidental use areas, accessory uses, and mixed occupancies are correct.*
- *Special Detailed Requirements Based on Use and Occupancy. Verify that special use and occupancy classification is correct. Verify compliance of special provision for atriums, covered mall buildings, high-rise buildings, hazardous occupancies, stages, amusement buildings, and other occupancies or uses.*
- *Type of Construction. Verify that the type of construction is correct for the type of occupancy. Verify that structural members, interior walls, floor/ceiling and roof/ceiling assemblies, roofs, and stairways conform to type of construction requirements.*
- *Height and Area Design. Verify the actual height and floor area designs are within the allowable height and floor area limits.*
- *Exterior Walls and Openings. Verify exterior walls, openings, parapets, and projections conform to the fire-resistive requirements for the type of construction, location on the site, and proximity to other buildings.*
- *Interior Environment. Verify compliance of minimum room dimensions and openings. Verify compliance of lighting, ventilation, exhaust, and minimum sanitation systems.*
- *Safeguards during Construction. Verify precautions are taken and implemented for the safety at the construction site and specified in the construction documents.*
- *Accessibility. Verify accessibility of facilities and building elements to physically disabled persons comply with minimum code requirements.*

- *Materials Specifications. Verify that materials specifications comply with minimum code requirements and listing.*
- *Footing and Foundations. Verify that necessary reports are submitted of the building site's soil capacity and stability when required. Verify that footings are specified with correct size and setbacks and extend below the frost line. Verify that footing and foundation reinforcement meets minimum requirements.*
- *Stepped Footings and Special Foundations. Verify that stepped footing, piles, piers, and special foundations are correctly specified. Verify that wood members are protected against insects and decay.*
- *Foundation Walls. Verify that foundation stem walls are correctly sized and have sufficient height above grade. Verify that foundation wall reinforcement, anchor bolts, and fasteners are correct type, size, spacing, and grade. Verify that foundation damp proofing and water proofing is specified where required. Verify maximum unbalanced fill height.*
- *Floor Construction/Systems. Verify that floor system spans, bearing, and connections comply with minimum code requirements. Verify that materials are protected against insects and decay where required. Verify that subflooring and decking has required thickness, span, and grade and meets installation specifications. Verify compliance of floor design. Verify that crawlspaces have required clearance, ventilation, insulation, screening and access openings.*
- *Concrete Slabs and Floor Systems. Verify that concrete slabs and floor systems are designed in compliance with standards and material characteristics for specified exposure conditions.*
- *Wood Wall Systems. Verify compliance of wall systems for proper spans, spacing, bearing, and connections. Verify that pre-engineered wall systems are specified in accordance with their listing and manufacturer's specifications. Verify that wood members are protected against insects and decay where required.*
- *Steel Framing Systems. Verify steel wall system spans, spacing, bearing, and connections. Verify that pre-engineered steel wall systems are in accordance with their listing and manufacturer's specifications.*
- *Masonry Wall Systems. Verify compliance of masonry grouting, bonding, mortar type, height, size, lintels, reinforcement, and distance between lateral supports for masonry walls.*
- *Concrete Wall Systems. Verify compliance of height, size, attachments, bracing, and distance between lateral supports, and reinforcement for concrete wall systems.*
- *Exterior Wall Coverings. Verify that exterior veneers and siding have correct anchorage, support, and backing. Verify that a weather-resistant barrier is correctly specified for all walls and around all wall openings. Verify that exterior sheathing materials are correctly sized and specified. Verify that plaster, stucco, and metal lath have correct thickness and fasteners.*
- *Interior Wall Coverings. Verify that wall and ceiling coverings are correct type and thickness, are correctly supported and fastened, and meet minimum sanitation requirements.*
- *Roof/Ceiling Assemblies. Verify compliance of roof/ceiling construction for span, grade, type, connections, and bearing. Verify that trusses are designed in accordance with code requirements and specified in accordance with their listing and manufacturer's specifications. Verify compliance of roof access and roof top structures. Verify that roof/ceiling insulation is of allowable materials, and is correctly specified. Verify that vapor moisture barriers are correctly specified. Verify ventilation, screens, and access of attic and ceiling area construction.*
- *Roof Coverings. Verify correct classification of roof coverings, roof slope, installation, flashings, and details, and method of roof drainage.*

- *Means of Egress. Verify general means of egress requirements, exit access, exits, and exit discharge. Verify compliance of public way, public use areas, and the use of public property. Verify emergency escape and rescue requirements.*
- *Number, Width, and Arrangements of Exits. Verify that the occupancy load calculations are correct. Verify that the correct number of exits and required egress width are provided. Verify that arrangement of exits conform to requirements for separation, travel distances, and intervening rooms. Verify compliance of corridor arrangement and dead ends.*
- *Exit Stairways and Ramps. Verify that stairways and ramps have correct width, rise run, slope, landings, headroom, and height. Verify correct escape illumination, signage, handrails, guards, and other requirements.*
- *Exit Doors and Egress Windows. Verify that exit doors have the correct direction of swing, size, and type of hardware. Verify that windows intended for use as emergency egress have correct clear opening areas, width, height, operational constraints, window wells and ladders.*
- *Protected Exit ways. Verify that corridors, exit passageways, stairway enclosures, horizontal exits, exit balconies, and exit courts are provided where required and have the correct fire protection.*
- *Special Exiting. Verify correct number and width of aisles and correct seat spacing. Verify requirements for grandstands, bleachers, and specific occupancies and uses.*
- *Fire Alarm and Extinguishing Systems. Determine when fire alarm, sprinkler, and standpipe systems are required; verify compliance of fire suppression systems.*
- *Area and Occupancy Separations. Verify that area separation and occupancy separation walls and floor/ceiling assemblies are located where required and have correct fire-resistance.*
- *Fire Resistive Construction. Verify that the materials used for structural members, walls, floor/ceiling, and roof/ceiling assemblies and shaft enclosures comply with requirements for fire-resistive protection. Verify that fire resistance rated construction and location is in compliance with the code and tested assembly requirements.*
- *Heat and Smoke. Verify that heat, smoke detection, smoke barriers, and control systems are provided where required, and are correctly powered and listed. Verify that curtain boards and smoke and heat vents are correctly specified.*
- *Interior Finishes. Verify that interior finishes meet required flame-spread and smoke developed classifications based on location, use and occupancy classifications, and are correctly supported.*
- *Safety Glazing. Verify that safety glazing is specified where required.*
- *Opening Protective, Penetrations, and Joint Systems. Verify compliance of opening protective, penetrations, and joint systems in fire rated assemblies. Verify that fire blocking and draft stopping is specified where required.*
- *Miscellaneous Construction. Verify that exterior stairs, ramps, porches, decks, and balconies which are open to the weather support designed loads; are of suitable materials; and have required slope and width, tread, riser, headroom, guards, and handrail dimensions.*
- *Building Services and Special Construction. Verify compliance of existing structures, membrane structures, temporary structures, pedestrian walkways, tunnels, awnings and canopies, marquees, signs, towers, antennas, elevators, and conveyance systems. Verify seismic restrain, high-wind, and snow-load design requirements. Verify that elevator lobbies, cars, and hoist ways are correctly specified. Verify that elevator shafts are properly vented.*
- *Fireplaces and Chimneys. Verify that fireplaces, flues, and chimneys are correctly designed and have required clearances from combustible construction.*

ICC- Mechanical Plans Examiner - Core Competencies

- *Project administration. Verify that the permit application is completed for the submitted construction documents. Verify that products not detailed in the code are approved.*
- *General Administ**ration.** Provide general information on code provisions and communicate using proper code definitions and terminology with co- workers and with individuals who submit plans.*
- *Water Heaters and Boilers. Determine code compliance of water heaters and boilers.*
- *Cooling and Refrigeration. Determine code compliance of cooling and refrigeration systems including refrigeration equipment rooms.*
- *Furnaces and Heaters. Determine code compliance of furnaces and heaters.*
- *Other Systems. Determine code compliance of various special systems. This includes systems utilizing fuel burning equipment such as solid fuel burning appliances, interior open-flame grills, pool and sauna heaters, hydronic heating systems, incinerators, crematories, decorative appliances, etc.*
- *Exhaust and Ventilation Systems. Determine code compliance of supply, return air, outside air, environmental exhaust air systems, and natural and mechanical ventilations systems, including clothes dryer exhaust.*
- *Hoods and Kitchen Ventilation. Determine code compliance of commercial hoods, kitchen ventilation, grease ducts, and filters. Determine code compliance of kitchen makeup air systems.*
- *Hazardous Vapors and Emergency Exhaust System. Determine code compliance of the exhaust system for flammable and hazardous vapors and verify code compliance of the emergency exhaust systems for atrium, stairway, or smokeproof enclosures and smoke control systems.*
- *Product-Conveying and Ventilation Systems. Determine code compliance of product-conveying ventilation systems, ducts, motors, fans, filters, hoods, and enclosures shown on the submitted plans.*
- *Plenums and Duct Material. Determine code compliance of duct materials, ratings, insulation, listings, gage, etc. and application of ducts and plenums.*
- *Fire and Smoke Control. Determine code compliance of fire detection systems and smoke and fire dampers.*
- *Size, Location, and Materials of Ducts and Openings. Determine code compliance of the size, location, materials, and number of combustion air ducts and openings.*
- *Sources of Combustion Air in Confined/Unconfined Spaces. Determine code compliance of the combustion air systems for confined and unconfined spaces and of the sources of combustions air. 06 Chimneys and Vents 17%*
- *Venting of Fuel-Burning Appliances. Determine code compliance of the size, type, location, clearances, connections, and terminations of vents and venting systems. Verify clearances, bracing, listing, and labeling of the installation of metal chimneys and factory-built chimneys.*
- *Chimney and Vent Connectors. Determine code compliance of the size, type, location, and clearances of chimney and vent connectors.*
- *Fuel Supply Sizing. Determine code compliance of fuel pipe system components.*
- *Fuel System Components. Determine code compliance of materials, supports, valves, regulators, etc.*

Upon the completion of this step option, the inspector learns the full extent of the plans examination process for permits that they are responsible for. While cross training at plan exam is no longer completed under a 6 month rotation, the knowledge base to complete plan review should be held when completing step option four.

*Additionally, an inspector advancing using this step option must also meet or exceed the thresholds for advancement established in the **QUANTITATIVE CORE COMPETENCIES.***

Construction Inspector, Step Option 5

To advance a step using step option five, an inspector shall have obtained the job required certifications/licensure as outlined in step one. Step option five requires the inspector to successfully complete one of the following two inspection credential paths issued by the International Code Council (ICC) and the State of Wisconsin:

1. ***State of Wisconsin Storage Tank Systems Inspector***
2. ***ICC Fire Inspector II***

   Or

1. ***ICC Fire Inspector II***
2. ***ICC Fire Plans Examiner***

Note: The Department recognizes the NFPA Fire Inspector I or Wisconsin Technical College System Board Fire Service Certification (Semester 1and 2) as an equivalent to International Code Council Fire Inspector ll.

An inspector using step option five must demonstrate a thorough knowledge pertaining to the fundamentals of hazardous liquid, chemical, combustible, radioactive, health hazard occupancies, system and the equipment associated with them. Some of these components are found in the list below:

Storage Tank Systems Inspector - Core Competencies

- *Definitions. Demonstrate understanding of leaks, class IIIB liquid storage tanks, credential/certification/qualified persons, day tanks, hazardous substances, asphalt or similar substances, quarry sites, tank vehicles, transfer point containment, fixed versus portable tank storage, flammable/combustible classification, when are flammable/combustible liquids not regulated, capacity thresholds, labeling/posting/signage.*
- *Administration and Enforcement. Ability to perform plan review, inspection and general enforcement activities.*
- *Adopted Standards and General Requirements. Demonstrate knowledge and application of applicable standards. Demonstrate understanding of general tank requirements, certifications, enforcement and tank construction and marking.*
- *Specific Tank Storage Applications. Demonstrate knowledge of regulations pertaining to; Tanks storing used motor oil, Public waste oil collection points, Heating fuel storage, Heating oil tanks that are removed from service, Fuel storage for stationary combustion engines and gas turbines, Gasoline fuel tanks inside buildings, diesel and fuel oil tanks inside buildings, gasoline or diesel fuel supply tanks outside aboveground, fuel supply tank construction, outdoor installations, mushroom style venting, horizontal emergency venting, fuel system hoses, spill and overfill, collision protection, gasoline, diesel or fuel oil underground supply tanks, Converted tanks for the storage of flammable and combustible liquids, Bulk plants and terminals, Hazardous substances, Storage of class IA flammable liquids to include: tank design and construction, Location with respect to: property lines, public ways, and important buildings on the same property. Repairs and alterations, Secondary containment, Vacuum/Relief valve sizing and discharge location. Emergency shut-off for transfers.*

- *General Underground Storage Tank (UST) Storage. Demonstrate knowledge of regulations as to; Secondary containment, Containment or double-wall construction, Record keeping, Product inventory verification at retail facilities, Spill and overfill, Spill prevention for underground used oil tanks, Typical waste oil UST configurations, How to assess systems for adequate pipe slope. Leak detection requirements, Leak detection methods, Airport hydrant leak detection requirements, Operation and maintenance of corrosion protection, Testing, Maintenance and Repair of Cathode Protection (CP) systems, Certifications for corrosion protection, Wisconsin Certification levels for UST corrosion protection, Anode replacement and addition-personnel qualification policy, Adding impressed current to lined tanks, Tank lining of underground petroleum product storage tanks, Periodic inspection and repair of previously lined tanks, Seldom used and temporary out-of-service tanks, Changes in service, Tank system closure, Tank closure assessment, Conditions indicating a release, Investigating suspected releases and Responding to a release.*
- *Dispensing of Motor Fuels. Demonstrate knowledge of regulations as to; General fuel dispensing requirements (Point-of-Sale Fuel Dispensing, Attended and Unattended Fueling, Emergency Shut-off), Fuel dispensing using aboveground mobile tanks, Fuel dispensing systems using fixed tanks, Public access fueling, Fuel dispensing at farms and construction sites, Watercraft/Snowmobile/ATV fueling, Aircraft fuel dispensing, Racetrack and amusement park fueling operations, Ethanol-Based motor fuels.*
- *Credentialing Requirements.*
- *Labeling of dispensers and equipment.*
- *Multi-Product Dispensers.*
- *Signage and Labeling Criteria.*

ICC - Fire Inspector 2 - Core Competencies

General Inspection Administration

- *Communication*
- *Response To Inquiries*
- *Inspection Reports*
- *Research*
- *Permitting*
- *Recordkeeping*
- *Complaints*
- *Appeals Correspondence*
- *Legal Proceedings*
- *Scheduling*

General Provisions for Fire Safety

- *Means of Egress Evaluation.*
- *Identify Types of Construction.*
- *Determine the operational readiness of existing fire protection equipment and systems (e.g. fire alarm systems).*
- *Verify adequate emergency access for a site.*
- *Evaluate fire flow test data.*
- *Evaluate emergency planning and preparedness procedures.*
- *Perform fire safety inspections for various construction types.*
- *Perform fire safety inspections for fire protection.*
- *Perform fire safety inspections for exposures.*
- *Compare an approved plan to in installed fire protection system.*

Occupancies

- *Identify the occupancy classification based on description and use of a building.*
- *Calculate the allowable number of occupants in a building or area.*
- *Perform fire safety inspections for various occupancy types.*

Regulated Materials and Processes

- *Verify code compliance of industrial/commercial processes and operations.*

- *Verify code compliance for storage, handling, and use of regulated materials.*
- *Evaluate the interior finish, furnishings, and decorative materials for code compliance.*

ICC - Fire Plans Examiner - Core Competencies

1. ***Occupancy Types***
   - *Types Of Occupancy*
   - *Specific Hazards Associated With Use*
   - *Evaluation Of Special Fire Protection Features*
   - *Occupant Load*
2. ***Hazardous Materials***
   - *Management Plan*
   - *Inventory Statements*
   - *Fire Prevention Control*
   - *Mitigation Of Dangerous Conditions*
   - *Material Safety Data Sheets*
   - *Control Areas*
   - *Special Hazards*
   - *Storage Of Combustibles*
   - *Flammable And Combustible Liquids And Gasses*
   - *Storage Of Combustibles*
3. ***Fire Protection***
   - *Water Supply For Fire Protection*
   - *Sprinkler, Standpipes, And Alternate Automatic Fire Extinguishing Systems*
   - *Fire Alarm And Detection Systems*
   - *Portable Extinguishers*
   - *Smoke Control Systems*
2. ***Egress Safety***
   - *Emergency And Standby Power*
   - *Egress Doors*
   - *Stairs, Ramps, And Balconies*
   - *Exit Access*
   - *Access To Buildings, Windows And Roofs*
   - *Hazards To Fire Fighters*

Upon the completion of this step option, the inspector learns the intricacies of the advanced systems of hazardous materials, storage and handling of them. As the public typically interacts with these systems daily at gas stations, through their places of employment, etc., a thorough understanding and training is required.

The inspector at this level has two paths to choose from. The first focuses on the inspection of storage tank systems and other hazardous occupancies. The second retains the hazardous occupancies while adding the knowledge needed to complete fire plan examinations. The City of Milwaukee needs tank inspectors, but the volume of calls for inspections shows that not all inspectors need to be certified.

Additionally, an inspector advancing using this step option must also meet or exceed the thresholds for advancement established in the ***QUANTITATIVE CORE COMPETENCIES.***

Construction Inspector, Step Option 6

To advance a step using step option six, an inspector must successfully complete one the following inspection credentials issued by the International Code Council (ICC), or through other means described below:

1. ***International Code Council Certification***
   ICC – Certified Building Official (CBO)
   a. ***Management Module***
   b. ***Legal Module***
   c. ***Building Codes and Standards Module***
   OR
2. ***Have obtained an associate's degree in engineering, architecture, construction management, construction technology or a field closely related to construction.***
   OR
3. ***Have successfully completed 60 college credits of which a minimum of 39 credits are job-related or engineering-related, architectural design-related or construction management related.***
   OR
4. ***Have obtained a Bachelor's degree in engineering, architecture, architectural engineering, construction management, construction technology, mechanical engineering, or a field closely related to construction.***
   OR
5. ***Have obtained licensure through the State of Wisconsin as a Registered Architect or Professional Engineer.***

Listed below is a representation of the core competencies that an inspector must have a thorough knowledge of to advance using step option 6 for a Certified Building Official

ICC –Certified Building Official

Legal Module

Financial Management
- Budgets And Financing
- Implementation Of Financial Checks
- Verification Of Revenue Generation And Expenditures

Records Management
- Maintenance Of Employment Records
- Code Enforcement Records

Personnel Management
- Job Descriptions And Personnel Equipment
- Personnel Supervision
- Time-Management Efficiency
- Anti-Discrimination
- Employee Working Conditions
- Employee Discipline And Grievance
- Employee Professional Development

Interagency, Legislative, and Public Communication
- Code Adoption And Amendments
- Alternative Methods Through Appeals
- Interagency Cooperation
- Public Service And Information

Code Enforcement
- Permits, Notices And Orders
- Right Of Entry
- Hazard Abatement
- Tort Liability
- Legal Due Process
- Court Prosecution

Technology Module
- Architectural Plan Review
- Use And Occupancy Classification
- Construction Classification
- Means Of Egress Provisions
- Light, Ventilation And Sanitation Provisions
- Fire Resistance And Fire Protection Provisions

- Accessibility Provisions
- Environmental And Natural Hazard Provisions
- Special Use/Occupancy Provisions

Structural Plan Review

- Structural Provisions
- Material Standards And Construction Methods

Building System Plan Review

- Mechanical Provisions
- Plumbing Provisions
- Electrical Provisions

Field Inspection

- Site Inspection
- Foundation Inspection
- Structural Frame Inspection
- Building Envelope Inspection
- Electrical Inspections
- Plumbing Inspection
- Mechanical Inspection
- Fire Protection Inspection
- Final Building Inspection

An inspector using step option six must demonstrate a thorough knowledge and ability to perform complex construction inspections and plan reviews involving all applicable codes, standards and construction methodology. An inspector must demonstrate innate public communication skills and actively participate in mentoring less experienced inspectors.

Additionally, an inspector advancing using this step option must also meet or exceed the thresholds for advancement established in the ***QUANTITATIVE CORE COMPETENCIES.***